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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/262,657	03/04/99	YAMAZAKI	S SEL-126

COOK MCFARRON & MANZO LTD
200 WEST ADAMS STREET
SUITE 2850
CHICAGO IL 60606

MMC1/0719

EXAMINER

PRENTY, M

ART UNIT PAPER NUMBER

2822

14

DATE MAILED:

07/19/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

09/262,657

Applicant(s)

YAMAZAKI et al.

Examiner

Prenty

Art Unit

2822



-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE three MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on Apr 23, 2001
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 and 30-38 is/are pending in the application.
- 4a) Of the above, claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-15 and 30-38 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- 13) ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- a) ☐ All b) ☐ Some* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- *See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

- 15) ☒ Notice of References Cited (PTO-892)
- 16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 17) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s). 12
- 18) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 19) ☐ Notice of Informal Patent Application (PTO-152)
- 20) ☐ Other: _____

This Office Action is in response to the amendment filed April 23, 2001.

Claims 30-38 are rejected under 35 U.S.C. §112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Specifically, the specification does not describe first and second thin film transistors wherein both thin films contain germanium, as recited in independent claims 30, 33 and 36. Furthermore, the specification does not describe first and second thin film transistors wherein one thin film is doped with germanium while the other thin film is not doped with germanium, as recited in dependent claims 31, 34 and 37. Rather, the specification describes first and second thin film transistors wherein one film consists of silicon germanium (SiGe) and the other consists of silicon (Si). Claims 32, 35 and 38 depend on independent claims 30, 33 and 36, respectively, and are thus similarly rejected.

Claims 30-38 are rejected under 35 U.S.C. §112, first paragraph, because the specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the invention. Specifically, the specification is non-enabling for first and second thin film transistors wherein both thin films contain germanium, as recited in independent claims 30, 33 and 36. Furthermore, the specification is non-enabling for first and second thin film transistors wherein one thin film is doped with germanium while the other thin film is not doped with germanium, as recited in dependent claims 31, 34 and 37. Rather, the specification is enabling for first and second thin film transistors wherein one film consists of silicon germanium (SiGe) and the other consists of silicon (Si). Claims 32,

35 and 38 depend on independent claims 30, 33 and 36, respectively, and are thus similarly rejected.

Claims 1, 4, 7, 10, 13, 31, 34 and 37 are rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Independent claim 1 is incorrect in reciting "a second active layer comprising silicon...wherein said second active layer is not intentionally doped with germanium" because germanium is not a dopant for silicon. The specification discloses semiconductor films consisting of silicon germanium (SiGe) and silicon (Si). Claims 4, 7, 10 and 13 depend on independent claim 1 and are thus similarly incorrect. Claims 31, 34 and 37 are similarly incorrect in reciting silicon semiconductor films "doped" (or not) with germanium.

Claims 3, 6, 12 and 15 are rejected under 35 U.S.C. §103(a) as being unpatentable over Yamazaki et al. (United States Patent 6,160,271 already of record) together with King et al. (the *IEEE Transactions on Electron Devices* article submitted in the Information Disclosure Statement filed October 10, 2000). Specifically, the difference between Yamazaki et al. (see the entire patent, particularly Fig. 3C) and the set of rejected claims is their complementary driver circuit transistors are formed in polycrystalline silicon and polycrystalline silicon germanium, respectively. King et al. teach that it is advantageous to form complementary driver circuit transistors in polycrystalline silicon-germanium rather than polycrystalline silicon. It would have been obvious to one skilled in this art to advantageously form Yamazaki et al.'s complementary driver circuit transistors in polycrystalline silicon-germanium rather than polycrystalline silicon, as taught by King et al. Claims 3, 6, 12 and 15 are thus rejected under 35 U.S.C. §103(a) as being unpatentable over Yamazaki et al. together

with King et al.

Claims 3, 9 and 15 are rejected under 35 U.S.C. §103(a) as being unpatentable over Zhang et al. (United States Patent 5,648,277 cited in the Information Disclosure Statement filed March 4, 1999) together with King et al. (the *IEEE Transactions on Electron Devices* article submitted in the Information Disclosure Statement filed October 10, 2000). Specifically, the difference between Zhang et al. (see its Fig. 6 disclosure in particular) and the set of rejected claims is their complementary driver circuit transistors are formed in polycrystalline silicon and polycrystalline silicon germanium, respectively. King et al. teach that it is advantageous to form complementary driver circuit transistors in polycrystalline silicon-germanium rather than polycrystalline silicon. It would have been obvious to one skilled in this art to advantageously form Zhang et al.'s complementary driver circuit transistors in polycrystalline silicon-germanium rather than polycrystalline silicon, as taught by King et al. Claims 3, 9 and 15 are thus rejected under 35 U.S.C. §103(a) as being unpatentable over Zhang et al. together with King et al.

Claim 12 is rejected under 35 U.S.C. §103(a) as being unpatentable over Zhang et al. (United States Patent 5,648,277 cited in the Information Disclosure Statement filed March 4, 1999) together with King et al. (the *IEEE Transactions on Electron Devices* article submitted in the Information Disclosure Statement filed October 10, 2000) and Ohtani et al. (United States Patent 5,643,826 submitted in the Information Disclosure Statements filed March 4, 1999 and October 10, 2000). Specifically, the difference between the obvious Zhang et al. / King et al. semiconductor device (see above) and the semiconductor device recited in claim 12 is the latter's first active layer further comprises nickel. Ohtani et al. teach adding nickel

to amorphous thin films to accelerate crystallization (see the entire patent). It would have been further obvious to one skilled in this art to add nickel to the initially amorphous first active layer of the obvious Zhang et al. / King et al. semiconductor device (see Zhang et al's first active layer 1203, for example) to accelerate its crystallization, as taught by Ohtani et al. Claim 12 is thus rejected under 35 U.S.C. §103(a) as being unpatentable over Zhang et al. together with King et al. and Ohtani et al.

Claims 3, 6 and 15 are rejected under 35 U.S.C. §103(a) as being unpatentable over Inoue et al. (United States Patent 6,153,893 already of record) together with King et al. (the *IEEE Transactions on Electron Devices* article submitted in the Information Disclosure Statement filed October 10, 2000). Specifically, the difference between Inoue et al. (see its Fig. 2 disclosure in particular) and the set of rejected claims is their complementary driver circuit transistors are formed in polycrystalline silicon and polycrystalline silicon germanium, respectively. King et al. teach that it is advantageous to form complementary driver circuit transistors in polycrystalline silicon-germanium rather than polycrystalline silicon. It would have been obvious to one skilled in this art to advantageously form Inoue et al's complementary driver circuit transistors in polycrystalline silicon-germanium rather than polycrystalline silicon, as taught by King et al. Claims 3, 6 and 15 are thus rejected under 35 U.S.C. §103(a) as being unpatentable over Inoue et al. together with King et al.

Claim 12 is rejected under 35 U.S.C. §103(a) as being unpatentable over Inoue et al. (United States Patent 6,153,893) together with King et al. (the *IEEE Transactions on Electron Devices* article submitted in the Information Disclosure Statement filed October 10, 2000) and Ohtani et al. (United States Patent 5,643,826 submitted in the

Information Disclosure Statements filed March 4, 1999 and October 10, 2000). Specifically, the difference between the obvious Inoue et al. / King et al. semiconductor device (see above) and the semiconductor device recited in claim 12 is the latter's first active layer further comprises nickel. Ohtani et al. teach adding nickel to amorphous thin films to accelerate crystallization (see the entire patent). It would have been further obvious to one skilled in this art to add nickel to the initially amorphous first active layer of the obvious Inoue et al. / King et al. semiconductor device to accelerate its crystallization, as taught by Ohtani et al. Claim 12 is thus rejected under 35 U.S.C. §103(a) as being unpatentable over Inoue et al. together with King et al. and Ohtani et al.

Claims 2, 3, 5, 6, 11, 12, 14 and 15 are rejected under 35 U.S.C. §103(a) as being unpatentable over Zhang et al. (United States Patent 5,614,733 cited in the Information Disclosure Statement filed April 23, 2001) together with King et al. (the *IEEE Transactions on Electron Devices* article submitted in the Information Disclosure Statement filed October 10, 2000). Specifically, the difference between Zhang et al. (see the entire patent) and the set of rejected claims is their complementary driver circuit transistors are formed in polycrystalline silicon and polycrystalline silicon germanium, respectively. King et al. teach that it is advantageous to form complementary driver circuit transistors in polycrystalline silicon-germanium rather than polycrystalline silicon. It would have been obvious to one skilled in this art to advantageously form Zhang et al.'s complementary driver circuit transistors (but not its pixel circuit transistors, which Zhang et al. disclose are on a different design footing than the driver circuit transistors), in polycrystalline silicon-germanium rather than polycrystalline silicon, as taught by King et al. Claims 2, 3, 5, 6, 11, 12, 14 and 15 are

thus rejected under 35 U.S.C. §103(a) as being unpatentable over Zhang et al. together with King et al.

Claims 8 and 9 are rejected under 35 U.S.C. §103(a) as being unpatentable over Zhang et al. (United States Patent 5,614,733 cited in the Information Disclosure Statement filed April 23, 2001, hereinafter Zhang et al. '733) together with King et al. (the *IEEE Transactions on Electron Devices* article submitted in the Information Disclosure Statement filed October 10, 2000) and Zhang et al. (United States Patent 5,648,277 cited in the Information Disclosure Statement filed March 4, 1999, hereinafter Zhang et al. '277). Specifically, the difference between the obvious Zhang et al. '733 / King et al. device and the set of rejected claims is their second, matrix thin films comprise polycrystalline silicon and amorphous silicon, respectively. Zhang et al. '277 teach forming second, matrix thin films from amorphous silicon (see its Fig. 6 disclosure). It would have been further obvious to one skilled in this art to form the obvious Zhang et al. '733 / King et al. device's second, matrix thin film of amorphous silicon instead of polysilicon, as suggested by Zhang et al. '277. Claims 8 and 9 are thus rejected under 35 U.S.C. §103(a) as being unpatentable over Zhang et al. '733 together with King et al. and Zhang et al. '277.

Claims 1, 4, 10, 13 and 30-35, insofar as understood, are rejected under 35 U.S.C. §103(a) as being unpatentable over Zhang et al. (United States Patent 5,614,733 cited in the Information Disclosure Statement filed April 23, 2001) together with King et al. (the *IEEE Transactions on Electron Devices* article submitted in the Information Disclosure Statement filed October 10, 2000). Specifically, the difference between Zhang et al. (see the entire patent) and the set of rejected claims is their complementary driver circuit transistors are formed in polycrystalline silicon and

polycrystalline silicon germanium, respectively. King et al. teach that it is advantageous to form complementary driver circuit transistors in polycrystalline silicon-germanium rather than polycrystalline silicon. It would have been obvious to one skilled in this art to advantageously form Zhang et al.'s complementary driver circuit transistors (but not its pixel circuit transistors, which Zhang et al. disclose are on a different design footing than the driver circuit transistors), in polycrystalline silicon-germanium rather than polycrystalline silicon, as taught by King et al. Claims 1, 4, 10, 13, 15 and 30-35 are thus rejected under 35 U.S.C. §103(a) as being unpatentable over Zhang et al. together with King et al.

Claims 7 and 36-38, insofar as understood, are rejected under 35 U.S.C. §103(a) as being unpatentable over Zhang et al. (United States Patent 5,614,733 cited in the Information Disclosure Statement filed April 23, 2001, hereinafter Zhang et al. '733) together with King et al. (the *IEEE Transactions on Electron Devices* article submitted in the Information Disclosure Statement filed October 10, 2000) and Zhang et al. (United States Patent 5,648,277 cited in the Information Disclosure Statement filed March 4, 1999, hereinafter Zhang et al. '277). Specifically, the difference between the obvious Zhang et al. '733 / King et al. device and the set of rejected claims is their second, matrix thin films comprise polycrystalline silicon and amorphous silicon, respectively. Zhang et al. '277 teach forming second, matrix thin films from amorphous silicon (see its Fig. 6 disclosure). It would have been further obvious to one skilled in this art to form the obvious Zhang et al. '733 / King et al. device's second, matrix thin film of amorphous silicon instead of polysilicon, as suggested by Zhang et al. '277. Claims 7 and 36-38 are thus rejected under 35 U.S.C. §103(a) as being unpatentable over Zhang et al. '733 together with King et al. and Zhang et al. '277.

Saraswat et al. (United States Patent 5,250,818) is relevant to this application.

Applicant's argument is not persuasive. First, the "basic concept of the invention" is using silicon germanium (i.e., SiGe, not "germanium doped silicon") semiconductor in selected TFTs of a semiconductor device while using silicon (only) semiconductor (i.e., Si) in the remaining TFTs of the same semiconductor device. In any event, the "basic concept of the invention" argument is not commensurate in scope with independent claim 3 (or with incorrect amended independent claim 1 and problematic newly added claims 30-38 as well for that matter). Furthermore, although applicant's "basic concept of the invention" argument is commensurate in scope with amended independent claim 2, such is moot in view of the new grounds of rejection.

Applicant's amendment necessitated the new grounds of rejection. Accordingly, THIS ACTION IS MADE FINAL. See M.P.E.P. §706.07(a).¹ Applicant is reminded of the extension of time policy set forth in 37 C.F.R. §1.136(a).

A SHORTENED STATUTORY PERIOD FOR RESPONSE TO THIS FINAL ACTION IS SET TO EXPIRE THREE MONTHS FROM THE DATE OF THIS ACTION. IN THE EVENT A FIRST RESPONSE IS FILED WITHIN TWO MONTHS OF THE MAILING DATE OF THIS FINAL ACTION AND THE ADVISORY ACTION IS NOT MAILED UNTIL AFTER THE END OF THE THREE-MONTH SHORTENED STATUTORY PERIOD, THEN THE SHORTENED STATUTORY PERIOD WILL EXPIRE ON THE DATE THE ADVISORY ACTION IS MAILED, AND ANY EXTENSION FEE PURSUANT TO 37 C.F.R. §1.136(a) WILL BE CALCULATED FROM THE MAILING DATE OF THE ADVISORY ACTION. IN NO EVENT WILL THE STATUTORY PERIOD FOR RESPONSE EXPIRE LATER THAN SIX MONTHS FROM THE DATE OF THIS FINAL ACTION.

Registered practitioners can telephone examiner Prenty at (703) 308-4939.

All other parties should telephone (703) 308-0956.

¹ Alternatively, applicant's submission of an Information Disclosure Statement under 37 CFR 1.97(c) with the fee set forth in 37 CFR 1.17(p) on April 23, 2001 prompted the new grounds of rejection presented in this Office Action. Accordingly, THIS ACTION IS MADE FINAL. See MPEP §609(B)(2)(i).